

## Realistic Floating Breakwater Design Based on an Optimized 2D Model

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### ABSTRACT:

From previous study, a 2D floating breakwater shape which has optimal performance had been obtained. The performance was verified by using numerical relations and an experiment in towing tank as well. Moreover, its performance and characteristics in 3D case including in oblique waves case were also evaluated in the subsequent study. However, because the 3D model is formed by simply extruding the 2D shape in longitudinal direction, it produces only a uniform design. This design is considered to be less effective and efficient in terms of technical and economical points of views. Consequently, it is needed to modify the model so that a more realistic and efficient design of a floating breakwater model could be obtained without reducing significantly the performance obtained previously.

In the present study, some modifications of the original 3D floating breakwater model are performed. The performance and characteristics of the modified model in terms of body motions, wave elevations on the free surface and the second-order wave drift forces will be evaluated at various wavelengths by using higher order boundary element method (HOBEM). HOBEM which is based on the potential flow theory divides the body into a certain number of panels and uses quadratic representation for both the quadrilateral panels and the unknown velocity potentials on each panel. The accuracy of the computed results is confirmed by using Haskind-Newman and energy conservation relations. From the modification and evaluation of the models, a floating breakwater model which is more realistic and efficient compared to the original model, could be obtained.